



3rd International Workshop on Computationally Intelligent Methods in Processing and Analysis of Neuronal Big Data

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Mufti Mahmud*, M Shamim Kaiser♦

**Department of Computer Science, Nottingham Trent University, NG11 8NS – Nottingham, UK
Email: muftimahmud@gmail.com*

*♦Institute of Information Technology, Jahangirnagar University, Savar, 1342 – Dhaka, Bangladesh
Email: mskaiser@juniv.edu*

The brain as a part of the central nervous system (CNS) is specialized to process information simultaneously coming from diverse sources. The neurons work as basic information processing units in the brain and interconnect to each other to form hierarchical and/or parallel pathways. These pathways are mainly involved in transforming information originated from one or more sources into either action (as in motor movements) or specialized information understood by the brain itself (as in cognitive functions).

To have a detailed and complete understanding of these biological phenomena, the related research questions have been addressed using both experimental and theoretical approaches. In recent years, advancements in the neurotechniques allowed scientists to acquire large amount of experimental data and latest data-intensive, nature-inspired theoretical studies aim to reframe existing computational techniques to suggest future research on biophysical basis of brain research and its information processing capabilities.

Developing data-intensive and intelligent tools, as well as sophisticated neurotechniques, to decipher brain's information processing capability is one the biggest challenges in today's multidisciplinary brain science community is facing. To share recent progress in decoding neuronal information processing, this special session aims to provide a forum for scientists from diverse disciplines including – computer, electrical, biomedical, and neuro engineering – who are looking for more relevant information in decoding brain functions using expert and computationally intelligent systems.

This special session is expected to attract papers on recent research progress in the area of intelligent computational tools and techniques in acquiring and processing neuronal big data. The focus areas include, but not limited to, the following:

- Neural systems engineering and technology to study neural pathways;
- Processing and modelling of neuronal data for disease diagnosis and brain decoding;
- Bio-inspired methods for network analysis and pattern recognition in neural data;
- Novel machine learning techniques for neuronal big data analysis;
- Application of deep and reinforcement learning to neuronal big data analysis;
- Computationally intelligent techniques for neuroscience applications; and
- Hardware implementation of machine learning techniques for neuroscience research.